

CLAIMS

What is claimed is:

1 1. A method of propagating link state information in a routing
2 area of a network including a plurality of routers, comprising:

3 generating a node state advertisement at a first router of
4 the plurality of routers, the node state advertisement identifying
5 the first router and a link about which the first router desires
6 to receive link state information;

7 flooding the node state advertisement throughout the routing
8 area so as to ensure that substantially all of the plurality of
9 routers receive the node state advertisement;

10 at each of the routers receiving the node state
11 advertisement, determining whether the receiving router lies along
12 a path meeting a predetermined criteria between the link and the
13 first router; and

14 at each of at least one second router determined to lie
15 along such a path, (1) maintaining an association between the link
16 and the first router, the association indicating that link state
17 advertisements concerning the link are to be forwarded along the
18 path toward the first router, and (2) upon a change of the state
19 of the link, forwarding a corresponding link state advertisement
20 to an adjacent one of the routers along the path toward the first
21 router.

1 2. A method according to claim 1, wherein the predetermined
2 criteria is that the path be the shortest path between the link
3 and the first router.

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3. A method according to claim 1, wherein maintaining the association between the link and the first router comprises storing a next hop node identifier with a link state entry for the link, the next hop node identifier identifying the adjacent one of the routers.

4. A method according to claim 1, wherein the change of the state of the link comprises a change in unreserved bandwidth of the link.

5. A method according to claim 1, wherein the change of the state of the link comprises a change in latency of the link.

6. A method according to claim 1, wherein the change of the state of the link comprises failure of the link.

7. A method of performing protection switching in a network, comprising:

broadcasting a node state advertisement from an ingress node of a primary communications path in the network, the node state advertisement identifying the ingress node and a link included in the primary communications path, the ingress node transmitting ingress data traffic on the primary communications path in the absence of a failure thereon;

flooding the node state advertisement throughout a routing area of the network so as to ensure that substantially all of a plurality of routers in the routing area receives the node state advertisement;

13 at each of the routers receiving the node state
14 advertisement, determining whether the receiving router lies along
15 a desired signaling path between the ingress node and the link;

16 at each of the routers determined to lie along the desired
17 signaling path, (1) maintaining an association between the link
18 and the ingress node, the association indicating that link state
19 advertisements concerning the link are to be forwarded along the
20 desired signaling path toward the ingress node, and (2) upon a
21 change of the state of the link, forwarding a corresponding link
22 state advertisement to an adjacent one of the routers along the
23 desired signaling path toward the ingress node;

24 at a designated router for the identified link, upon a
25 failure of the link, originating a link-state advertisement
26 indicating that the link has failed, and forwarding the link-state
27 advertisement to an adjacent one of the routers along the desired
28 signaling path toward the ingress node; and

29 at the ingress node, upon receipt of the link-state
30 advertisement indicating that the link has failed, switching the
31 ingress data traffic from the primary communications path to a
32 backup communications path.

1 8. A method according to claim 7, wherein the desired signaling
2 path is the shortest path between the link and the ingress node.

3 9. A method according to claim 7, wherein maintaining the
4 association between the link and the ingress node comprises
5 storing a next hop node identifier with a link state entry for the
6 link, the next hop node identifier identifying the adjacent one of
7 the routers.